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## Helminthofauna of partridge (*Perdix perdix* L.) in the Lublin Palatinate

Helminthofauna kuropatwy (*Perdix perdix* L.) w woj. lubelskim

The helminthofauna of gallinaceous birds of Poland is hitherto completely insufficiently elaborated. Among studies on parasitic worms of domestic *Galliformes* in our country we notice only reports of Sinicyn (1896), Kowalewski (1895—1902) and Wadowski (1938). They offer only a fragmentary picture of the helminthofauna of those hosts. However, wild *Galliformes* in Poland were altogether not the theme of helminthological studies, because the single work of Gąsowska (1931) which deals, among others, with one species of tapeworm from the black grouse and capercaillie collected from the environment of Kiev (Ukraine) should not to be taken into consideration.

The aim of the present work is to obtain informations concerning the species set of worms, the degree of extensity and intensity of invasion, the relationship between the helminthofauna and the food, pathological lesions caused by the worms, and comparison of the species set of internal parasites of partridge with the hitherto described helminthofauna of domestic fowl.

### Material

The investigated material consisted of 270 partridges from the Lublin environment studied during the period from September 10th to December 31st 1956 (140 birds) and 1957 (130 birds). The investigated material was collected, therefore, in the course of two successive seasonal huntings.

The birds were examined by using of the method of complete helminthological dissections. Initially the subcutaneous tissue of legs was not examined; the mentioned tissue was examined by me following the personal communication with Dr. A.A. Spassky (1957) who drew my attention to the fact that in Siberia (USSR) in the mentioned tissue mature forms of nematodes from the suborder *Filariata* were found. However, in about 50 examined by me in the final stage of elaboration partridges I have not found any parasites in the subcutaneous tissue.

### Faunistic part

#### CESTOIDEA

##### *Hymenolepididae* Fuhrmann, 1907

##### *Hymenolepis cantaniana* (Polonio, 1860) Ransom, 1909

Syn.: *Taenia cantaniana* Polonio, 1860; *Davainea oligophora* Magal-liaes, 1898; *Davainea cantaniana* (Polonio, 1860) Railliet et Lucet, 1899; *Hymenolepis inermis* (Yoshida, 1910) Fuhrmann, 1932.

Hitherto this parasite was found in *Gallus gallus dom.*, *Colinus virginianus*, *Meleagris gallopavo*, *Numida meleagris*, *Pavo cristatus* and *Phasianus colchicus*. Partridge (*Perdix perdix* L.) is a new host of this worm.

Habitat: duodenum, rarer small intestine.

Geogr. distribution: cosmopolitan.

Morphological data of my material correspond wholly to descriptions of this species hitherto reported. Only the diameter of the oncospheres equal to 0.034—0.039 mm, is higher than the hitherto reported size (according to Skrjabin, 1917 — 0.022 — 0.025 mm).

I have found *H. cantaniana* in my material in 72 (27%) partridges. The intensity of invasion ranged from several to several thousands specimens.

The parasite was reported in Poland by Wadowski (1938) in *Gallus gallus domesticus*.

It appears, that *Hymenolepis* sp. reported by Gvozdev (1956) as living in *Alectoris graeca*, is the species *Hymenolepis cantaniana*.



## NEMATODA

*Heterakidae* Railliet et Henry, 1914*Heterakis gallinae* (Gmelin, 1790)

Syn.: *Ascaris gallinae* Gmelin, 1790; *Ascaris vesicularis* Froelich, 1791 ex parte; *Heterakis vesicularis* (Froelich, 1791) Dujardin, 1845; *Heterakis papillosa* Railliet, 1885 nec *Ascaris papillosa* Bloch, 1782.

Found in *Galliformes*, *Anseriformes* and *Passeriformes*.

Habitat: caecum.

Geogr. distribution: cosmopolitan.

*H. gallinae* was found in my material in 41 (15%) partridges. The intensity of invasion ranged from 1—28 specimens.

The parasite is common in Poland.

*Ascaridiidae* Skrjabin et Mosgovoy, 1953*Ascaridia compar* (Schränk, 1790) Travassos, 1913

Syn.: *Ascaris compar* Schränk, 1790; *Heterakis compar* (Schränk, 1790) Stossich, 1887; *Ascaris lagopodis* Froelich, 1802; *Fusaria compar* (Schränk, 1790).

Hitherto found in wild *Galliformes* and in the domestic hen.

Habitat: small intestine.

Geogr. distribution: cosmopolitan.

*Ascaridia compar* was found in my material in 4 (1.5%) partridges. The intensity of invasion ranged from 1—2 specimens.

Reported for the first time in Poland.

*Capillariidae* Neveu — Lemaire, 1936*Capillaria caudinflata* (Molin, 1858) Travassos, 1915

Syn.: *Trichosoma longicollis* Mehlis, 1831, nec Rudolphi, 1819; *Thominx longicollis* (Mehlis, 1831); *Colodium caudinflatum* Molin, 1858; *Trichosomum caudinflatum* (Molin, 1858); *Trichosoma gallinum* Kowalewski, 1894; *Trichosomum papillosum* Blome, 1909; *Thominx papillosum* (Blome, 1909); *Trichosomum papilligera* Railliet et Henry, 1911; *Capillaria blomeri* Travassos, 1915; *Capillaria gallina* (Goeze, 1782); *Capillaria columbae* var. *sturni* Cannon, 1939; *Capillaria* (*Thominx*) *caudinflata* (Molin, 1858) Wawilova, 1926; *Capillaria longicollis* (Mehlis, 1831), Madsen, 1945.

Hitherto found in domestic and wild *Galliformes* and in *Columbiformes* and, most likely by chance, also in *Anseriformes* and *Passeriformes*.

**Habitat:** small intestine (in my material mainly in the duodenum).

**Geogr. distribution:** cosmopolitan.

Because in the literature various dimensions of this parasite are described I am enclosing a comparative table of my own findings.

*Capillaria caudinflata* was found in my material in 42 (16%) partridges. The intensity of invasion ranged from 1—11 specimens.

The parasite was in Poland hitherto reported by Kowalewski (1902) in the small intestine of *Gallus gallus domesticus*.

### *Capillaria bursata* Freitas et Almeida, 1934

Syn.: *Aonchotheca bursata* (Freitas et Almeida, 1934) Lopez — Neyra, 1946.

Hitherto found exclusively in *Gallus gallus dom.* and *Phasianus colchicus*. The partridge is a new host of this parasite.

**Habitat:** caecum (a new habitat); hitherto it was found exclusively in the small intestine.

Table I

Comparison of measurements of *Capillaria caudinflata* after various authors (in mm)

| Measurements     | Čertkova<br>(1952) | Madsen<br>(1945) | Morgan,<br>Hawkins<br>(1953) | Dyk,<br>Klimeš,<br>Zavadil<br>(1957) | Author      |
|------------------|--------------------|------------------|------------------------------|--------------------------------------|-------------|
| <b>Male:</b>     |                    |                  |                              |                                      |             |
| Length           | 7.5—10.5           | 7.0—20.0         | 10.0—20.0                    | 10.0—20.0                            | 13.4—19.8   |
| Width            | 0.045—0.052        |                  | 0.05—0.06                    | 0.05—0.06                            | 0.044—0.054 |
| Oesophagus       | 3.7—4.81           |                  |                              |                                      | 5.5—7.3     |
| Spicule-length   | 0.84—1.05          | 0.67—1.89        | 0.85—1.7                     |                                      | 1.03—1.88   |
| Spicule-width    | 0.007              |                  |                              |                                      | 0.006       |
| <b>Female:</b>   |                    |                  |                              |                                      |             |
| Length           | 11.0—18.0          | 9.3—36.3         | 15.0—25.0                    | 15.0—25.0                            | 13.4—30.0   |
| Width            | 0.056—0.059        |                  | 0.06—0.07                    | 0.06—0.07                            | 0.051—0.073 |
| Oesophagus       | 4.07—6.12          |                  |                              |                                      | 4.88—8.78   |
| Vaginal appendix | 0.053—0.087        |                  |                              | to 0.12                              | 0.074—0.108 |
| Eggs-length      | 0.049—0.056        |                  | 0.050—0.059                  | 0.050—0.055                          | 0.046—0.054 |
| Eggs-width       | 0.024—0.028        |                  | 0.021—0.024                  | 0.020—0.024                          | 0.020—0.024 |



Geogr. distribution: hitherto reported in Brasil, USA and USSR.

The single specimen, a female, differs considerably from descriptions found hitherto in the literature, therefore dimensions of the female are given (in parentheses are the corresponding data reported by Čertkova, 1950).

The length of the body 33.4 mm (23—25 mm), the greatest width 0.081 mm (0.09—0.097 mm). The oesophagus, formed by 49 cells, is 8.54 mm (7.52—8.23 mm) in length. The distance between vulva and the terminal part of the oesophagus is 0.064 mm (0.079—0.089 mm). The genital pore is surrounded by two characteristic to this species cuticular swellings, 0.025 mm behind the genital pore there appears one, and 0.025 mm further on there appears the second cuticular papilla; they are also characteristic to this species. The dimensions of the eggs  $0.056 \times 0.064 \times 0.023$ — $0.025$  mm ( $0.059$ — $0.063 \times 0.028$ — $0.031$  mm).

In my material, one female of *C. bursata* was found in the caecum of one partridge.

The parasite is reported for the first time in Poland.

*Eucoelus annulatus* (Molin, 1858) Lopez-Neyra, 1946

Syn.: *Trichosomum annulatum* Molin, 1858; *Trichosomum strumosum* Reibisch, 1893; *Trichosomum delicatissimum* Perroncito et Tomiolo, 1900; *Capillaria (Thominx) strumosa* (Reibisch, 1893) Travassos, 1915; *Capillaria annulata* (Molin, 1858) Cram, 1927; *Capillaria ovulata* Graham, Thorpe et Hectorne, 1929.

Hitherto reported in domestic and wild *Galliformes*.

Habitat: oesophageal submucosa.

Geogr. distribution: cosmopolitan.

The more important dimensions of the sole female found by me are given because they differ distinctly from the data given in the literature.

The length of the body 46 mm (according to Gagarin, 1951 — 20.0—22.4 mm; according to Freitas et Lent, 1935 — 22.5—22.56 mm; according to Reibisch, 1893 — 37.0 mm), the greatest width 0.16 mm. The head swelling 0.031 mm in length, width 0.012 mm. The oesophagus formed by 25 cells, 6.34 mm in length, the genital pore situated 0.18 mm behind the terminal part of the oesophagus. The eggs reach dimensions of  $0.06 \times 0.064 \times 0.022$ — $0.025$  mm. From the above given descriptions

it appears that the ratio between the anterior part of the body to the posterior part is not, as reported in the literature 1:3.5 but circa 1:6.3.

In my material *E. annulatus* was found in 2 partridges (0.7 per cent), one specimen in each of the birds (one specimen was damaged).

In Poland reported for the first time.

### *Syngamidae* Leiper, 1912

#### *Syngamus trachea* (Montagu, 1811) Chapin, 1925

Syn.: *Fasciola trachea* Montagu, 1811; *Syngamus trachealis* Siebold, 1836; *Strongylus trachealis* (Siebold, 1836) Nathusius, 1837; *Strongylus pictus* Creplin, 1849; *Sclerostoma tracheale* (Siebold, 1836) Diesing, 1851; *Syngamus mucronatus* Schlotthauber, 1860; *Syngamus primitivus* Molin, 1860; *Syngamus sclerostomum* Molin, 1860; *Syngamus bifurcatus* Theobald, 1896; *Strongylus primitivus* (Molin, 1860) Huttyra et Marek, 1910; *Syngamus gracilis* Chapin, 1925.

Hitherto reported in 15 species of *Passeriformes*, 14 species of *Galliformes* and 5 species of other birds. The partridge (*Perdix perdix*) is a new host to this parasite.

Habitat: trachea.

Geogr. distribution: cosmopolitan.

In my material *Syngamus trachea* was found in 2 partridges, in each one pair of the parasites.

In Poland common.

### General part

1. Among the 270 examined partridges 136 were invaded, that is 50 per cent of cases. This is a serious infestation considering that the birds live principally on grain and plant buds. The invasion of birds was somewhat greater in 1957 — (55%) than in 1956 (46%).

2. The intensity of the nematode invasion is relatively low because it fluctuates within the limits of several to under hundred specimens. However, the intensity of the tapeworm invasion is very high because it extends from several to several thousands specimens.

3. The influence of food on the species set of the parasitic fauna of the partridge is very distinctive. There were found pa-



parasites of a simple form of development (*Heterakis gallinae*, *Ascaridia compar*), eventually such, which require as intermediate hosts earthworms (*Capillaria caudinflata*, *Capillaria bursata*, *Eucoleus annulatus*, *Syngamus trachea*) or insects (*Hymenolepis cantaniana*) — which are in certain seasons of the year an important constituent of the food for the partridge. A distinct illustration of relationship between the helminthofauna population and the kind of food consumed by the birds is the absence in the studied hosts of trematodes and thorny-headed worms. As known the most typical intermediate hosts of the above mentioned parasites usually do not constitute the food of the partridge.

4. It should be stated that no morbid lesions caused by the parasites were found. Only in few partridges an inflammation of the mucous membrane of the alimentary tract was found by the presence of several thousands of *Hymenolepis cantaniana*.

5. All parasitic worms found by me in the partridge were also found in the domestic fowl. Thus the partridge may take part in the spreading of many parasites of the domestic fowl.

6. In invaded birds there appeared simultaneously at the highest three species of parasites. The occurrence of parasites expressed in percentages is as follows: 105 partridges (39%) were invaded with one species of parasite, 28 partridges (10%) with two species, and 3 partridges (1%) with three species of parasites; the remaining 50 per cent of partridges were free of parasites.

7. It is reported for the first time that the partridge is a new host to three species of parasites (*Hymenolepis cantaniana*, *Capillaria bursata* and *Syngamus trachea*).

8. For the first time in Poland the occurrence of three species of parasites: *Ascaridia compar*, *Capillaria bursata* and *Eucoleus annulatus* is reported.

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## STRESZCZENIE

Temat pracy był podyktowany brakiem jakichkolwiek opracowań polskich odnośnie helmintofauny dzikich kurowatych.

Materiał składa się z 270 kuropatw z okolic Lublina, badanych w czasie od 10.IX. — 31.X.1956 roku (140 sztuk) i w tym samym czasie 1957 roku (130 sztuk), a więc w dwóch kolejnych sezonach łownych.

Metodą pełnych sekcji helmintologicznych stwierdzono w badanym materiale 1 gatunek tasiemca oraz 6 gatunków nicieni:

*Cestoda:*

*Hymenolepis cantaniana* (Polonio, 1860) — jel. cienkie (27% inwazji);

*Nematoda:*

*Heterakis gallinae* (Gmelin, 1790) — jel. ślepe (15% inwazji);

*Ascaridia compar* (Schränk, 1790) — jel. cienkie;

*Capillaria caudinflata* (Molin, 1858) — jel. cienkie (16% inwazji);

*Capillaria bursata* Freit. et Alm., 1934 — jel. ślepe (nowa lokalizacja);

*Eucoleus annulatus* (Molin, 1858) — przełyk;

*Syngamus trachea* (Montagu, 1811) — tchawica.

Spośród zbadanych 270 kuropatw 136 było zarażonych, co stanowi 50%. Jest to, jak na ptaki odżywiające się ziarnem i pączkami roślin, zarobaczenie duże. Nieco większy procent zarobaczenia stwierdzono w roku 1957 (55%), niż w roku 1956 (46%).

Intensywność inwazji nicieni jest stosunkowo mała, gdyż waha się w granicach kilku do kilkudziesięciu egzemplarzy, natomiast intensywność inwazji tasiemców jest bardzo wysoka — od kilku do kilku tysięcy egzemplarzy.

Wpływ pokarmu na skład gatunkowy helmintofauny kuropatwy jest bardzo wyraźny. Stwierdzono mianowicie: pasożyty o rozwoju prostym (*Heterakis gallinae* i *Ascaridia compar*), względnie takie, których żywicielami pośrednimi są dżdżownice (*Capillaria caudinflata*, *C. bursata*, *Eucoleus annulatus* i *Syngamus trachea*) lub owady tegopokrywe (*Hymenolepis cantaniana*) — stanowiące w pewnych okresach roku dość poważny składnik pokarmu kuropatwy. Ilustracją wyraźnej zależności składu helmintofauny od rodzaju pobieranego pokarmu jest brak u badanych kuropatw przywr i kociągów, których najbardziej typowi żywiele pośredni nie stanowią zwykle pokarmu tego ptaka.

Zmian anatomo-patologicznych, spowodowanych obecnością pasożytów, w zasadzie nie stwierdzono; jedynie w nielicznych przypadkach obserwowano zapalenie błony śluzowej przewodu pokarmowego przy obecności kilku tysięcy *Hymenolepis cantaniana* w jednej kuropatwie.

Wszystkie stwierdzone przeze mnie u kuropatwy robaki pasożytnicze występują również u kury domowej, kuropatwa więc może brać udział w rozprzestrzenianiu się wielu pasożytów ptactwa domowego.

U osobników zarażonych występowały równocześnie najwyżej 3 gatunki pasożytów. Procentowo stosunek ten przedstawia się następująco: jednym gatunkiem pasożyta było zarażonych 105 (39%) kuropatw, dwoma gatunkami — 28 (10%), a trzema gatunkami 3 kuropatwy (1%); pozostałe 50% kuropatw było wolnych od pasożytów.

Dla 3 gatunków pasożytów (*Hymenolepis cantaniana*, *Capillaria bursata* i *Syngamus trachea*) stwierdza się po raz pierwszy kuropatwę jako nowego żywiciela.

Dla jednego gatunku nicienia (*Capillaria bursata*) stwierdza się nową lokalizację — jelito ślepe (dotychczas stwierdzany wyłącznie w jelicie cienkim).

Po raz pierwszy w Polsce stwierdzono występowanie 3 gatunków pasożytów: *Ascaridia compar*, *Capillaria bursata* i *Eucoleus annulatus*.